CONTENTS

No. 1 JANUARY 1991

EDITORIAL COMMENT

Editorial Announcements and Comments 1

GUIDE FOR AUTHORS

Manuscript Submission and Copyright Release Form 3
Guide for Authors (Revised January 1991) 5

CRITICAL REVIEW

Magnesium Absorption: Mechanisms and the Influence of Vitamin D, Calcium and Phosphate. *Laurie L. Hardwick, Michael R. Jones, Nachman Brautbar and David B. N. Lee* 13

ARTICLES

Lipids

Effect of Chronic Glucagon Administration on the Metabolism of Triacylglycerol-Rich Lipoproteins in Rats Fed a High Sucrose Diet. *Catherine Guettet, Najmuddin Rostaqui, Nicole Navarro, Bernard Lecuyer and Denis Mathe* 24
Medium- and Long-Chain Triglycerides Labeled with ^{13}C: A Comparison of Oxidation After Oral or Parenteral Administration in Humans. *Cornelia C. Metges and Günther Wolfram* 31

Proteins and Amino Acids

Changes in the Composition of Mammary Tissue, Liver and Muscle of Rat Dams During Lactation and After Weaning. *Soledad DeSantiago, Homero Hernandez Montes, Samuel Flores-Huerta and Salvador Villalpando* 37

Carbohydrates and Fibers

Physiological Effects of Retrograded, α-Amylase-Resistant Cornstarch in Rats. *J. M. Gee, R. M. Faulks and I. T. Johnson* 44

Vitamins

Comparative Antioxidant Effectiveness of Dietary β- Carotene, Vitamin E, Selenium and Coenzyme Q_{10} in Rat Erythrocytes and Plasma. *Rosario Zamora, Francisco J. Hidalgo and Al L. Tappel*..... 50
Characterization of Ascorbic Acid Uptake by Isolated Rat Kidney Cells. *Delores M. Bowers-Komro and Donald B. McCormick* 57
Modulation by Dietary Vitamin E of I-Compounds (Putative Indigenous DNA Modifications) in Rat Liver and Kidney. *Donghui Li, Yue-Ming Wang, Raghu G. Nath, Sheela Mistry and Kurt Randerath*. 65

In Vivo Kinetics of Intestinal Absorption of Riboflavin in Rats. *Sabine Feder, Hannelore Daniel and Gertrud Rehner* 72

Minerals and Trace Elements

Effect of Chemical Form of Selenium on Tissue Glutathione Peroxidase Activity in Developing Rats. *Helen W. Lane, Ralph Strength, Janet Johnson and Marguerite White*..... 80
Effect of Ethanol on Cadmium Uptake and Metabolism of Zinc and Copper in Rats Exposed to Cadmium. *Geeta Sharma, Rajat Sandhir, Ravindra Nath and Kirandip Gill* 87
Mucus and Iron Absorption Regulation in Rats Fed Various Levels of Dietary Iron. *E. M. Wien and D. R. Van Campen* 92

Nutrient Interactions

Biotin Deficiency Per Se Is Teratogenic in Mice. *Toshiaki Watanabe and Akira Endo*..... 101

Nutrient Uptake and Transport

A High Yield Preparation of Brush Border Membrane Vesicles from Organ-Cultured Embryonic Chick Jejunum: Demonstration of Insulin Sensitivity of Na^+-Dependent D-Glucose Transport. *Hanna Debiec, Heide S. Cross and Meinrad Peterlik* 105

Growth, Development and Aging

Dietary Regulation of Intestinal Glycosyl-Transferase Activities: Relation Between Developmental Changes and Weaning in Rats. *Marie-Claire Biol, Sabine Pintori, Bruno Mathian and Pierre Louisot* 114

Nutrition and Immunlogy

Effect of Ascorbic Acid Nutriture on Blood Histamine and Neutrophil Chemotaxis in Guinea Pigs. *Carol S. Johnston and Shining Huang*..... 126

Nutrition, Pharmacology and Toxicology

Enzyme Activities Associated with Carcinogen Metabolism in Liver and Nonhepatic Tissues of Rats Maintained on High Fat and Food-Restricted Diets. *Gloria Y. Kwei, Jan Zaleski, Ronald G. Thurman and Frederick C. Kauffman*..... 131
Dietary Selenium and Antioxidant Status: Toxic Effects of 1,2-Dimethylhydrazine in Rats. *Barbara C. Pence*..... 138

ISSUES AND OPINIONS IN NUTRITION

Protein Evaluation, Amino Acid Scoring and the Food and Drug Administration's Proposed Food Labeling Regulations. *Vernon R. Young and Peter L. Pellett* 145

LETTER TO THE EDITOR

Does Dietary Protein Increase Urinary Calcium? *Herta Spencer and Lois Kramer*..... 151
Reply to the Letter of Spencer & Kramer. *Jane E. Kerstetter and Lindsay H. Allen*..... 152

Announcements..... 153

No. 2 FEBRUARY 1991

ARTICLES

Lipids

Effect of Increasing the Dietary (*n*-3) to (*n*-6) Polyunsaturated Fatty Acid Ratio on Murine Liver and Peritoneal Cell Fatty Acids and Eicosanoid Formation. *K. Shane Broughton, Jay Whelan, Ingibjorg Hardardottir and John E. Kinsella* 155

The Effects of Fish Oil on Triglycerides, Cholesterol, Fibrinogen and Malondialdehyde in Humans Supplemented with Vitamin E. *Olle Haglund, Riitta Luostarinen, Rolf Wallin, Lars Wibell and Tom Saldeen* 165

Vitamins

Depletion and Repletion Kinetics of Vitamin C in Humans. *James Blanchard* 170

Bioavailability of Pyridoxine-5′-β-D-Glucoside Determined in Humans by Stable-Isotopic Methods. *Jesse F. Gregory III, Paula R. Trumbo, Lynn B. Bailey, John P. Toth, Thomas G. Baumgartner and James J. Cerda* 177

Intramuscular Relative Dose Response (RDR) Determination of Liver Vitamin A Stores in Rats. *Richard D. Zachman and Xiaoming Chen* 187

Minerals and Trace Elements

Low Zinc Intake Affects Maintenance of Pregnancy in Guinea Pigs. *J. Apgar and G. A. Everett* .. 192

Effect of Dietary Silicon on Growth and Skeletal Development in Chickens. *Michael A. Elliot and Hardy M. Edwards, Jr.* 201

Nutrient Uptake and Transport

Copper Uptake and Transfer to the Mouse Fetus During Pregnancy. *H. J. McArdle and R. Erlich.* 208

Dietary Acid and Alkali Loading Do Not Alter Taurine Uptake by Renal Proximal Tubule Brush Border Membrane Vesicles in Kittens. *Taesun Park, Quinton R. Rogers, James G. Morris and James P. G. Morris* 215

Growth, Development and Aging

Interaction of Somatotropin and Genotype on the Requirement for Energy in Two Lines of Finishing Pigs. *David A. Nossaman, Allan P. Schinckel, Lindy F. Miller and Scott E. Mills* 223

Metabolism and Hormonal Regulation

Principal Gastrointestinal Variables Associated with Metabolic Heat Production in Pigs: Statistical Cluster Analyses. *Jerome C. Pekas and James E. Wray* 231

Nutrition, Pharmacology and Toxicology

Short-Term Effects of Dehydroepiandrosterone Treatment in Rats on Mitochondrial Respiration. *Pamarthi F. Mohan and Margot P. Cleary* 240

Endotoxin and Lipid Peroxidation In Vivo in Selenium- and Vitamin E–Deficient and –Adequate Rats. *John T. Sword, Arthur L. Pope and William G. Hoekstra* 251

Endotoxin and Lipid Peroxidation In Vitro in Selenium- and Vitamin E–Deficient and –Adequate Rat Tissues. *John T. Sword, Arthur L. Pope and William G. Hoekstra* 258

Nutrition and Disease Interactions

Nutrient Intake Variability in a Pediatric Population: Implications for Study Design. *Judy Z. Miller, Teresa Kimes, Siu Hui, Mark B. Andon and C. Conrad Johnston, Jr.* 265

Announcements 275

No. 3 MARCH 1991

CRITICAL REVIEW

The Importance of α-Lactalbumin in Infant Nutrition. *Willi E. Heine, Peter D. Klein and Peter J. Reeds* 277

ARTICLES

Lipids

Effects of Dietary Selenium and Fish Oil (MaxEPA) on Arachidonic Acid Metabolism and Hemostatic Function in Rats. *Jihyun Song and Rosemary C. Wander*..... 284

Proteins and Amino Acids

Leucine-Induced Amino Acid Antagonism in Rats: Muscle Valine Metabolism and Growth Impairment. *Robert C. May, Nicola Piepenbrock, Ralph A. Kelly and William E. Mitch*..... 293

Carbohydrates and Fibers

Refeeding of Rats Fasted 36 Hours with Five Different Carbohydrates and with Malt Extract: Differential Effects on Glycogen Deposition in Liver and Muscle, on Plasma Insulin and on Plasma Triglyceride Levels. *Stéphanie Mörikofer-Zwez, Rosina Flückiger-Isler, Jean-Maurice Kahn and Paul Walter*. 302
Fermentable Carbohydrate Reaching the Colon after Ingestion of Oats in Humans. *Elizabeth K. Lund and Ian T. Johnson*..... 311

Vitamins

Influence of Age and Sex on Vitamin B-6 Vitamer Distribution and on Vitamin B-6 Metabolizing Enzymes in Wistar Rats. *Wilhelmina Bode, Johannes A. J. Mocking and Henk van den Berg*..... 318

Minerals and Trace Elements

Blood Pressure, Fluid Compartments and Utilization of Chloride in Rats Fed Various Chloride Diets. *Susan M. Kaup, J. L. Greger, Mary S. K. Marcus and Nancy M. Lewis*..... 330
The Influence of Zinc-Binding Ligands in Fetal Circulation on Zinc Clearance Across the In Situ Perfused Guinea Pig Placenta. *Phyllis G. Paterson, Alberto Mas, Bibudhendra Sarkar and Stanley H. Zlotkin*. 338
Correlation between the Size of the Selenite-Exchangeable Metabolic Pool and Total Body or Liver Selenium in Rats. *Morteza Janghorbani, Christine S. Mooers, Michael A. Smith, Terrence Hazell, Kurt Blanock and Bill T. G. Ting*..... 345
Changes in Cu,Zn-Superoxide Dismutase, Cytochrome c Oxidase, Glutathione Peroxidase and Glutathione Transferase Activities in Copper-Deficient Mice and Rats. *Joseph R. Prohaska* 355

Nutrient Interactions

Branched-Chain and Other Amino Acids in Tissues of Rats Fed Leucine-Limiting Amino Acid Diets Containing Norleucine. *Jean K. Tews, Joyce J. Repa and Alfred E. Harper*..... 364

Metabolism and Hormonal Regulation

Normal Number and Kinase Activity of Insulin Receptors in Liver of Genetically Fat Chickens. *Jean Simon, Bernadette Chevalier, Michel Derouet and Bernard Leclercq*..... 379
Opposite Effect of Cold on Energetic Efficiency in Normal and Obese Wistar Rats with Hypothalamic Lesions. *Jan Jeszka, Hans J. Grav, Halvor Holm, Bo-Egil Hustvedt, Arne Løvø and Øydis Ueland* 386

Nutrition and Immunology

Decreased Resistance and Immune Response to *Escherichia coli* Infection in Chicks with Low or High Intakes of Vitamin A. *Aharon Friedman, Amit Meidovsky, Gabriel Leitner and David Sklan* .. 395

SYMPOSIUM

Nutritional Assessment and Intervention: Interface of Science and Policy

Nutritional Assessment and Intervention: Interface of Science and Policy: Introduction. *William H. Dietz* 401
Principals for Effective Surveys of Hunger and Malnutrition in the United States. *Jean-Pierre Habicht and Linda D. Meyers* 403
Food Insecurity: A Nutritional Outcome or a Predictor Variable? *Cathy C. Campbell* 408
Sampling the Difficult-to-Sample. *James M. Lepkowski* 416

ISSUES AND OPINIONS IN NUTRITION

Data Supporting Supplementation of Humans With Vitamin E. *Max K. Horwitt* 424

Announcements 430

No. 4 APRIL 1991

ARTICLES

Lipids

Effects of Dietary Fibers on Nonfasting Plasma Lipoprotein and Apolipoprotein Levels in Rats. *Patsy M. Nishina, Barbara O. Schneeman and Richard A. Freedland* 431
Influence of Dietary Fat, Vitamin E, Ethoxyquin and Indomethacin on the Synthesis of Prostaglandin E_2 in Brain Regions of Mice. *Mohsen Meydani, Simin Nikbin Meydani, Alice C. Shapiro, John B. Macauley and Jeffrey B. Blumberg* 438

Vitamins

Bioavailability of Food Folates and Evaluation of Food Matrix Effects with a Rat Bioassay. *A. J. Clifford, M. K. Heid, J. M. Peerson and N. D. Bills* 445
Tissue Discrimination Between Dietary *RRR*-α- and all-*rac*-α-Tocopherols in Rats. *Willy A. Behrens and René Madère* 454

Minerals and Trace Elements

Effect of Hyperoxia on Oxygen Free Radical Defense Enzymes in the Lung of Zinc-Deficient Rats. *Carla G. Taylor and Tammy M. Bray* 460
Increased Lung Copper-Zinc-Superoxide Dismutase Activity and Absence of Magnetic Resonance Imaging–Detectable Lung Damage in Copper-Deficient Rats Exposed to Hyperoxia. *Carla G. Taylor and Tammy M. Bray* 467
Cardiac Catecholamine Metabolism in Copper-Deficient Rats. *Karen E. Seidel, Mark L. Failla and Robert W. Rosebrough* 474

Nutrient Interactions

Effect of Long-Term Fish Oil Supplementation on Vitamin E Status and Lipid Peroxidation in Women. *Mohsen Meydani, Felicia Natiello, Barry Goldin, Nancy Free, Margo Woods, Ernst Schaefer, Jeffrey B. Blumberg and Sherwood L. Gorbach* 484

Growth, Development and Aging

Influence of Age and Magnesium on Calcium Metabolism in Rats. *Sarah T. McElroy, Jane E. Link, Richard P. Dowdy, Kurt R. Zinn and Mark R. Ellersieck* 492

Ileal Compensation for Age-Dependent Loss of Jejunal Function in Rats. *Marc Reville, Franchine Gosse, Jean Kachelhoffer, Michel Doffoel and Francis Raul* 498

Fetal Organ Response to Maternal Protein Deprivation During Pregnancy in Swine. *Wilson G. Pond, Ralph R. Maurer and John Klindt* 504

Age-Related Effects of Chronic Ethanol Intake on Vitamin A Status in Fisher 344 Rats. *Sohrab Mobarhan, Helmut K. Seitz, Robert M. Russell, Rajendra Mehta, Jordan Hupert, Howard Friedman, Thomas J. Layden, Mohsen Meydani and Patricia Langenberg* 510

Metabolism and Hormonal Regulation

Collagen Production in Fasted and Food-Restricted Rats: Response to Duration and Severity of Food Deprivation. *Robert Spanheimer, Tinko Zlatev, Guillermo Umpierrez and Mario DiGirolamo* .. 518

Regulation of Carnitine Acyltransferase Synthesis in Lean and Obese Zucker Rats by Dehydroepiandrosterone and Clofibrate. *Linda J. Brady, Rona R. Ramsay and Paul S. Brady* 525

Raw Soy and Purified Proteinase Inhibitors Induce the Appearance of Inhibitor-Resistant Trypsin and Chymotrypsin Activities in Wistar Rat Duodenal Juice. *Halvor Holm, Aud Jørgensen and Lars E. Hanssen* 532

Metabolic Fate of Dietary Carnitine in Human Adults: Identification and Quantification of Urinary and Fecal Metabolites. *Charles J. Rebouche and Catherine A. Chenard* 539

Nutrition and Immunology

Oral (*n*-3) Fatty Acid Supplementation Suppresses Cytokine Production and Lymphocyte Proliferation: Comparison Between Young and Older Women. *Simin Nikbin Meydani, Stefan Endres, Margo M. Woods, Barry R. Goldin, Cynthia Soo, Ann Morrill-Labrode, Charles A. Dinarello and Sherwood L. Gorbach* 547

Vitamin A Status and the Immune Response to Pneumococcal Polysaccharide: Effects of Age and Early Stages of Retinol Deficiency in Rats. *Ana Maria G. Pasatiempo, Christopher E. Taylor and A. Catharine Ross* 556

Effect of Cholecystokinin Immunization, Enhanced Food Intake and Growth of Swine on Lean Yield and Carcass Composition. *Jerome C. Pekas* 563

Nutrition, Pharmacology and Toxicology

Effect of Dietary Calcium on Colon Carcinogenesis Induced by a Single Injection of 1,2-Dimethylhydrazine in Rats. *Manjushree R. Karkare, Terry D. Clark and Howard P. Glauert* 568

ISSUES AND OPINIONS IN NUTRITION

The Legal Implications of Dietary Fats: Risks of Cardiovascular Disease and the Duty of Food Manufacturers. *Donald M. Black and Shari L. Knauer* 578

Announcements 583

No. 5 MAY 1991

ARTICLES

Lipids

Metabolic Effects in Rats of a Diet with a Moderate Level of Medium-Chain Triglycerides. *Marc Chanez, Brigitte Bois-Joyeux, Maurice J. Arnaud and Jean Peret* 585
Lack of an Association Between Cellular Phospholipid Triene:Tetraene Ratio and Proliferation of Human Skin Fibroblasts in Culture. *Soverin Karmiol and William J. Bettger* 595
Utilization of Medium-Chain Triglycerides by Neonatal Piglets: Chain Length of Even- and Odd-Carbon Fatty Acids and Apparent Digestion/Absorption and Hepatic Metabolism. *Jack Odle, Norlin J. Benevenga and Thomas D. Crenshaw* 605
Postnatal Age and the Metabolism of Medium- and Long-Chain Fatty Acids by Isolated Hepatocytes from Small-for-Gestational-Age and Appropriate-for-Gestational-Age Piglets. *Jack Odle, Norlin J. Benevenga and Thomas D. Crenshaw* 615
Influence of Background Composition of the Diet on the Lipemic Effect of Fish Oil vs. Corn Oil in Rats. *Susilowati Herman, A. Djaeni Sediaoetama, Darwin Karyadi and Anton C. Beynen* 622
Interaction Between Fish and Vegetable Oils in Relation to Rat Leucocyte Leukotriene Production. *Michael J. James, Leslie G. Cleland, Robert A. Gibson and Joanna S. Hawkes* 631

Proteins and Amino Acids

Absorptive Behavior of Oligo-L-Methionine and Dietary Proteins in a Casein or Soybean Protein Diet: Porto-Venous Differences in Amino Acid Concentrations in Unrestrained Rats. *Hiroshi Hara and Shuhachi Kiriyama* 638
Identification of Tetrahydro-β-carboline-3-carboxylic Acid in Foodstuffs, Human Urine and Human Milk. *Junko Adachi, Yasuhiko Mizoi, Takeaki Naito, Yumi Ogawa, Yoshiyuki Uetani and Ichiya Ninomiya* 646
Changes in Rat Plasma Apolipoproteins and Lipoproteins During Moderate Protein Deficiency: Potential Use in the Assessment of Nutritional Status. *Patricia Gouache, Béatrice Le Moullac, Fanny Bleiberg-Daniel, Roberte Aubert and Claudie Flament* 653
High Levels of Dietary Amino and Branched-Chain α-Keto Acids Alter Plasma and Brain Amino Acid Concentrations in Rats. *Kevin P. Block and Alfred E. Harper* 663

Carbohydrates and Fibers

Effects of Soybean Fiber on Cecal Digestion in Rats Previously Adapted to a Fiber-Free Diet. *Marie-Anne Levrat, Stephen R. Behr, Christian Rémésy and Christian Demigné* 672
Starch Bioavailability in the Upper Gastrointestinal Tract of Colectomized Rats. *Leslie A. Hildebrandt and Judith A. Marlett* 679

Minerals and Trace Elements

Longitudinal Changes in the Mineral Composition of Mouse Milk and the Relationship to Zinc Metabolism of the Suckling Neonate. *Brenda L. Reis, Carl L. Keen, Bo Lönnerdal and Lucille S. Hurley* 687
Mineral Status of Mice Suckling Early-, Mid- and Late-Lactating Foster Dams. *Brenda L. Reis, Carl L. Keen, Bo Lönnerdal and Lucille S. Hurley* 700
Absorption and Biological Half-Life in Humans of Intrinsic and Extrinsic ^{54}Mn Tracers from Foods of Plant Origin. *Phyllis E. Johnson, Glenn I. Lykken and Eugene D. Korynta* 711
Dietary Lead and Calcium: Effects on Blood Pressure and Renal Neoplasia in Wistar Rats. *John D. Bogden, Sheldon B. Gertner, Francis W. Kemp, Robbie McLeod, Kay S. Bruening and Haingsub R. Chung* 718
The Impact of Varying Degrees of Iron Nutriture on Several Functional Consequences of Iron Deficiency in Rats. *Myfanwy J. Borel, Stephen H. Smith, Dale E. Brigham and John L. Beard* 729

Nutrient Uptake and Transport

Comparative Digestion of Maltitol and Maltose in Unanesthetized Pigs. *Alain Rérat, Pierre Vaissade and Pierre Vaugelade* 737

Nutrition and Immunology

Alterations in Splenic Lymphoid Cell Subsets and Activation Antigens in Copper-Deficient Rats. *Shukal Bala, Mark L. Failla and Joan K. Lunney* 745

Nutrition and Behavior

Protein Synthesis in the Prepyriform Cortex: Effects on Intake of an Amino Acid–Imbalanced Diet by Sprague-Dawley Rats. *Joseph L. Beverly III, Dorothy W. Gietzen and Quinton R. Rogers*..... 754

Prenatal Protein Malnutrition and Maternal Behavior in Sprague-Dawley Rats. *Janina R. Galler and John Tonkiss* 762

Announcements..... 770

No. 6 JUNE 1991

ARTICLES

Lipids

Dietary Fat and Phospholipase A_2 Activity of Sprague-Dawley Rat Large Intestine. *Atif B. Awad, Sharon R. Mallen, Peter J. Horvath and Carol S. Fink*..... 771

Brewer's Spent Grain, Serum Lipids and Fecal Sterol Excretion in Human Subjects with Ileostomies. *Jie-Xian Zhang, Eva Lundin, Henrik Andersson, Ingvar Bosaeus, Sven Dahlgren, Göran Hallmans, Roger Stenling and Per Åman* 778

Proteins and Amino Acids

Propargylglycine Infusion Effects on Tissue Glutathione Levels, Plasma Amino Acid Concentrations and Tissue Morphology in Parenterally-Fed Growing Rats. *Ei Soon Cho, Jane Hovanec-Brown, Robert J. Tomanek and Lewis D. Steginк*..... 785

Carbohydrates and Fibers

A Small Dose of Soluble Alginate-Fiber Affects Postprandial Glycemia and Gastric Emptying in Humans with Diabetes. *Inga Torsdottir, Magne Alpsten, Göran Holm, Ann-Sofi Sandberg and Jukka Tölli.* 795

Alteration in Levels of Immunoreactive Epidermal Growth Factor in the Gastrointestinal Mucosa of Fischer Rats Fed a Diet Containing 10% Wheat Bran. *R. Paul Schaudies, S. Satchithanandam and Richard J. Calvert*..... 800

Minerals and Trace Elements

Effects of Chemical Form and Dosage on the Incorporation of Selenium into Tissue Proteins in Rats. *Dietrich Behne, Antonios Kyriakopoulos, Stefan Scheid and Hildegard Gessner* 806

Myofibrillar, Mitochondrial and Valvular Morphological Alterations in Cardiac Hypertrophy among Copper-Deficient Rats. *Denis M. Medeiros, Donna Bagby, George Ovecka and Richard McCormick* 815

Ferric Iron Absorption in Rats: Relationship to Iron Status, Endogenous Sulfhydryl and Other Redox Components in the Intestinal Lumen. *Elizabeth M. Wien and Darrell R. Van Campen*..... 825

Nutrient Interactions

Large Intestinal pH and Ammonia in Rats: Dietary Fat and Protein Interactions. *Hsi-Chiang Lin and Willard J. Visek* 832

Nutrient Requirements

Maintenance of Zinc-Dependent Hepatic Functions in Rat Hepatocytes Cultured in Medium Without Added Zinc. *Joseph J. Schroeder and Robert J. Cousins* 844

Growth, Development and Aging

Tissue Taurine Content, Activity of Taurine Synthesis Enzymes and Conjugated Bile Acid Composition of Taurine-Deprived and Taurine-Supplemented Rhesus Monkey Infants at 6 and 12 mo of Age. *J. A. Sturman, J. M. Messing, S. S. Rossi, A. F. Hofmann and M. Neuringer* 854

Metabolism and Hormonal Regulation

Serum Gastrin Increases with Increasing Dietary Calcium But Not with Increasing Dietary Fat or Fiber in Fischer-344 Rats. *Marianne K. Floor, Saleem Jahangeer, Carolyn D'Ambrosio and Oliver Alabaster* 863

Nutrient Utilization by Cells Isolated From Rat Jejunum, Cecum and Colon. *S. E. Fleming, M. D. Fitch, S. DeVries, M. L. Liu and C. Kight* 869

Nutrition, Pharmacology and Toxicology

Brain Energy Consumption in Ethanol-Treated Long-Evans Rats. *Juan R. Viña, John E. Salus, M. Regina DeJoseph, Federico Pallardo, J. Towfighi and Richard A. Hawkins* 879

Colon Mucosal Cell Damage by Ammonia in Rats. *Hsi-Chiang Lin and Willard J. Visek* 887

Nutrition and Gene Expression

Hepatic Ceruloplasmin Gene Expression is Unaltered in the Toxic Milk Mouse. *Julian F. B. Mercer, Andrew Grimes, David M. Danks and Harold Rauch* 894

Porcine Fatty Acid Synthase: Cloning of a Complementary DNA, Tissue Distribution of Its mRNA and Suppression of Expression by Somatotropin and Dietary Protein. *Ana M. Mildner and Steven D. Clarke* 900

Nutrition and Disease Interactions

Dietary Plant Materials and Development of Diabetes in the BB Rat. *Jafar Hoorfar, Fraser W. Scott and Heather E. Cloutier* 908

LETTER TO THE EDITOR

The Reproducibility, Sensitivity and Specificity of the Relative Dose Response (RDR) Test for Determining Vitamin A Status. *James Allen Olson* 917

Reply to the Letter of Dr. Olson. *Noel W. Solomons, Jesus Bulux, Robert M. Russell, Frank D. Morrow and Gerard Dallal* 919

Invitation for Nominations for 1992 921

Announcements 924

No. 7 JULY 1991

ARTICLES

Lipids

Alteration of Serum Lipoprotein Metabolism by Polychlorinated Biphenyls and Methionine in Rats Fed a Soybean Protein Diet. *Hiroaki Oda, Hideo Fukui, Yoshinori Hitomi and Akira Yoshida*..... 925

Regulation of Cholesterol and Lipoprotein Metabolism in Guinea Pigs Mediated by Dietary Fat Quality and Quantity. *Maria Luz Fernandez and Donald J. McNamara*..... 934

The Hypocholesterolemic Effect of Dietary Soybean Protein vs. Casein in Hamsters Fed Cholesterol-Free or Cholesterol-Enriched Semipurified Diets. *A.H.M. Terpstra, J. C. Holmes and R. J. Nicolosi*.. 944

Lipid Metabolism Responses in Rats Fed Beef Tallow, Native or Randomized Fish Oil and Native or Randomized Peanut Oil. *Remi De Schrijver, Daniel Vermeulen and Elke Viaene*..... 948

Cardiolipins from Rats Fed Different Dietary Lipids Affect Bovine Heart Cytochrome *c* Oxidase Activity. *Sakiyo Yamaoka-Koseki, Reiko Urade and Makoto Kito*..... 956

Regulation of Hepatic Microsomal Cytochrome P450IIE1 Level by Dietary Lipids and Carbohydrates in Rats. *Jeong-Sook H. Yoo, Shu M. Ning, Carol B. Pantuck, Eugene J. Pantuck and Chung S. Yang* 959

Chick Nutritional Encephalomalacia and Prostanoid Formation. *E. Véricel, P. Budowski and M. A. Crawford*..... 966

Proteins and Amino Acids

Triiodothyronine Administration Affects Urea Synthesis in Rats. *Kazutoshi Hayase, Goro Yonekawa, Hidehiko Yokogoshi and Akira Yoshida*..... 970

A Chemically Defined Diet for Maximal Growth of Pigs. *Thau Kiong Chung and David H. Baker* 979

Carbohydrates and Fibers

Interaction of Dietary Protein Differing in Sulfur Amino Acid Content and Pectin on Bile Acid Conjugation in Immature and Mature Rats. *Takashi Ide and Michihiro Sugano*..... 985

Effects of Diet Forage-to-Concentrate Ratio and Intake on Energy Metabolism in Growing Beef Heifers: Whole Body Energy and Nitrogen Balance and Visceral Heat Production. *Christopher K. Reynolds, Henry F. Tyrrell and Paul J. Reynolds*..... 994

Effects of Diet Forage-to-Concentrate Ratio and Intake on Energy Metabolism in Growing Beef Heifers: Net Nutrient Metabolism by Visceral Tissues. *Christopher K. Reynolds, Henry F. Tyrrell and Paul J. Reynolds*..... 1004

Vitamins

Human Plasma all-*trans*-, 13-*cis*- and 13-*cis*-4-Oxoretinoic Acid Profiles During Subchronic Vitamin A Supplementation: Comparison to Retinol and Retinyl Ester Plasma Levels. *Christian Eckhoff, Michael D. Collins and Heinz Nau*..... 1016

Minerals and Trace Elements

Copper Deficiency in a Genetically Hypertensive Cardiomyopathic Rat: Electrocardiogram, Functional and Ultrastructural Aspects. *Denis M. Medeiros, Zhiming Liao and Robert L. Hamlin*..... 1026

Manganese Turnover in Chicks as Affected by Excess Phosphorus Consumption. *Karen J. Wedekind, Michael R. Murphy and David H. Baker*..... 1035

Nutrient Interactions

The Absorption of Pteroylpolyglutamate and Intestinal Pteroylpolygammaglutamyl Hydrolase Activity in Zinc-Deficient Rats. *Tsunenobu Tamura and Lucia L. Kaiser*..... 1042

Carnitine Status and Lipid Utilization in Neonatal Piglets Fed Diets Low in Carnitine. *M. Terry Coffey, Rachel B. Shireman, Dennis L. Herman and Evan E. Jones*..... 1047

Nutrient Requirements

The Level of Dietary Protein Affects the Vitamin B-6 Requirement of Cats. *Sungchul C. Bai, David A. Sampson, James G. Morris and Quinton R. Rogers* 1054
Vitamin B-6 Requirements of Elderly Men and Women. *Judy D. Ribaya-Mercado, Robert M. Russell, Nadine Sahyoun, Frank D. Morrow and Stanley N. Gershoff* 1062

Growth, Development and Aging

Growth Measurements in Sprague-Dawley Rats Fed Diets of Very Low Fat Concentration. *Ruth B. S. Harris* 1075
High Sucrose Diet and Exercise: Effects on Insulin-Receptor Function of 12- and 24-mo-old Sprague-Dawley Rats. *Kristin C. Eiffert, Roger B. McDonald and Judith S. Stern* 1081
Relationship Between Growth and Selected Liver Enzyme Activities of Individual Rainbow Trout. *Rosemary L. Walzem, Trond Storebakken, Silas S. O. Hung and Robert J. Hansen*..... 1090
Stage of Development and Fasting Affect Protein Synthetic Activity in the Gastrointestinal Tissues of Suckling Rats. *Douglas G. Burrin, Teresa A. Davis, Marta L. Fiorotto and Peter J. Reeds* 1099

Metabolism and Hormonal Regulation

Physiological Response of Mature Rats to Replacement of Dietary Fat with a Fat Substitute. *Ruth B. S. Harris and William K. Jones*..... 1109
Evaluation of Energy Sources With and Without Carnitine in Newborn Pig Heart and Liver. *Dale C. Honeyfield and John A. Froseth*..... 1117
Gastric Inhibitory Polypeptide and Insulin Responses to Orally Administered Amino Acids in Genetically Obese Hyperglycemic (*ob/ob*) Mice. *Peter R. Flatt, Piotr Kwasowski, Roger J. Howland and Clifford J. Bailey* 1123
Effects of Diet and Ketones on Rat Pancreatic Lipase in Cultured Acinar Cells. *Karen K. Hirschi, Janet E. Sabb and Patsy M. Brannon* 1129

Nutrition and Disease Interactions

Prevention of the Incidence of Diabetes by Dietary Sorbose in Nonobese Diabetic Mice. *Mitsuhiro Furuse, Chiharu Kimura, Hisahide Takahashi and Jun-Ichi Okumura*..... 1135

LETTER TO THE EDITOR

Fatty Liver Induced by Methionine Supplementation of Low Protein Diet: Effect of Inositol Supply. *Joël Leclerc*..... 1139
Reply to the Letter of Dr. Leclerc. *Shuhachi Kiriyama and Hideyuki Chiji*..... 1140

Erratum..... 1141
Announcements..... 1142

No. 8 AUGUST 1991

BIOGRAPHICAL ARTICLE

Edward Garfield High (1919–1986). *Harry D. Day* 1143

CRITICAL REVIEW

Obesity, A Disorder of Nutrient Partitioning: The MONA LISA Hypothesis. *George A. Bray* 1146

ARTICLES

Lipids

High Dietary Linoleic Acid Affects the Fatty Acid Compositions of Individual Phospholipids from Tissues of Atlantic Salmon (*Salmo salar*): Association with Stress Susceptibility and Cardiac Lesion. *J. Gordon Bell, Alasdair H. McVicar, Moira T. Park and John R. Sargent* 1163

Dietary (*n*-3) Fatty Acids Alter Fatty Acid Composition and Prostaglandin Synthesis in Rat Testis. *Prithiva S. Chanmugam, Mary D. Boudreau and Daniel H. Hwang* 1173

Dietary (*n*-6) Polyunsaturated Fatty Acids Affect β-Adrenergic Receptor Binding and Adenylate Cyclase Activity in Pig Adipocyte Plasma Membrane. *Christine Nicolas, Daniele Lacasa, Yves Giudicelli, Yves Demarne, Brigitte Agli, Marie-Jose Lecourtier and Claude Lhuillery* 1179

Proteins and Amino Acids

Protein Quality and Quantity Influence Free Amino Acid Levels in the Brain and Serum of Rats During Lactation. *G. Richard Jansen, Robert Binard and John B. Longenecker* 1187

Dietary Taurine Content and Feline Reproduction and Outcome. *John A. Sturman and Jeffrey M. Messing* 1195

Vitamins

Kinetics of Rat Peripheral Nerve, Forebrain and Cerebellum α-Tocopherol Depletion: Comparison with Different Organs. *Jean-Marie Bourre and Michel Clement* 1204

Effect of Dietary Deficiency and Supplementation with all-*rac*-α-Tocopherol on Hepatic Content in Rats. *Anders Bjørneboe, Marit S. Nenseter, Bente F. Hagen, Gunn-Elin Aa. Bjørneboe, Kristian Prydz and Christian A. Drevon* 1208

Phenytoin Treatment and Folate Supplementation Affect Folate Concentrations and Methylation Capacity in Rats. *G. Franklin Carl, Mary L. Smith, Grace M. Furman, Isao Eto, Robert A. Schatz and Carlos L. Krumdieck* 1214

Minerals and Trace Elements

Magnesium Deficiency Affects Plasma Lipoprotein Composition in Rats. *Elyett Gueux, Andrzej Mazur, Philippe Cardot and Yves Rayssiguier* 1222

Copper Uptake and Retention in Liver Parenchymal Cells Isolated from Nutritionally Copper-Deficient Rats. *Gerrit J. Van den Berg, Jeroen J. M. de Goeij, Ingrid Bock, Marion J. J. Gijbels, Adriaan Brouwer, K. Y. Lei and Henk F. J. Hendriks* 1228

Rumen Succinate Production May Ameliorate the Effects of Cobalt-Vitamin B-12 Deficiency on Methylmalonyl CoA Mutase in Sheep. *D. Glenn Kennedy, Paul B. Young, W. John McCaughey, Seamus Kennedy and W. John Blanchflower* 1236

Partial Sequence of Human Plasma Glutathione Peroxidase and Immunologic Identification of Milk Glutathione Peroxidase As the Plasma Enzyme. *Nelly Avissar, J. Randall Slemmon, Ivan S. Palmer and Harvey J. Cohen* 1243

Contribution of Sulfate and Sulfoesters to Total Sulfur Intake in Infants Fed Human Milk. *Mary E. McNally, Stephanie A. Atkinson and David E. C. Cole* 1250

Metabolism and Hormonal Regulation

Hepatic Denervation Alters the Disposition of an Enteral Glucose Load in Conscious Dogs. *Michael J. Pagliassotti, Chitoshi Tarumi, Doss W. Neal and Alan D. Cherrington* 1255

Nutrition and Immunology

Effect of Dietary (n-3) and (n-6) Fatty Acids on In Vivo Pulmonary Bacterial Clearance by Neonatal Rabbits. *John B. D'Ambola, Ernesto E. Aeberhard, Nhan Trang, Saba Gaffar, Cynthia T. Barrett and Michael P. Sherman* 1262

Dietary Arginine Supplementation Does Not Enhance Lymphocyte Proliferation or Interleukin-2 Production in Young and Aged Rats. *Alayne G. Ronnenberg, Kathy L. Gross, Wilburta J. Hartman, Simin N. Meydani and Ronald L. Prior* 1270

Nutrition and Gene Expression

Specific Decrease in Liver Insulin-Like Growth Factor-I and Brain Insulin-Like Growth Factor-II Gene Expression in Energy-Restricted Rats. *Daniel S. Straus and Carla D. Takemoto* 1279

Nutrition and Behavior

Threonine Concentration in the Prepyriform Cortex Has Separate Effects on Dietary Selection and Intake of a Threonine-Imbalanced Diet by Rats. *Joseph L. Beverly III, Dorothy W. Gietzen and Quinton R. Rogers* 1287

LETTER TO THE EDITOR

Comments on Some Changes in Plasma Cholesterol and Vitamin E When Different Fats are Fed. *Max K. Horwitt* 1293

BOOK REVIEW

Basic Issues of the History of Nutrition. Karl Y. Guggenheim *Reviewed by K. J. Carpenter*..... 1294

Announcements..... 1295

No. 9 SEPTEMBER 1991

BIOGRAPHICAL ARTICLE

Hugh Sinclair (1910–1990). *Thomas H. Jukes*..... 1297

ARTICLES

Lipids

Modulation of Lipid Chylomicron-Synthesizing Enzymes in Rats by the Dietary (n-6):(n-3) Fatty Acid Ratio. *Magali Chautan, Moniques Charbonnier, Jeannie Léonardi, Marc André, Huguette Lafont and Gilles Nalbone*..... 1305

Interrelationship of Plasma Triglycerides and HDL Size and Composition in Rats Fed Different Dietary Saturated Fats. *Denise M. Ney, Hui-Chuan Lai, John B. Lasekan and Michael Lefevre* 1311

Dietary Cholesterol and the Origin of Cholesterol in the Brain of Developing Rats. *John Edmond, Rose A. Korsak, Jack W. Morrow, George Torok-Both and Don H. Catlin*..... 1323

Dietary (*n*-3) Fatty Acids Affect Rat Heart, Liver and Aorta Protective Enzyme Activities and Lipid Peroxidation. *Mary R. L'Abbé, Keith D. Trick and Joyce L. Beare-Rogers* 1331

Proteins and Amino Acids

Uptake and Metabolism of L-2-Oxo-[^{35}S]Thiazolidine-4-carboxylate by Rat Cells is Slower than that of L-[^{35}S]Cysteine or L-[^{35}S]Methionine. *Relicardo M. Coloso, Lawrence L. Hirschberger and Martha H. Stipanuk* 1341

Malnutrition Induces an Increase in Intermediate Filament Protein Content of Rat Cerebral Cortex. *Murilo M. Paz, Giselle B. Valente, Carla I. Tasca, Angela G. de Mattos and Regina Pessoa Pureur* 1349

Protein Deficiency Suppresses Bone Resorption in Sheep Based on a Short-Term in vivo Bone Model. *Tohru Matsui, Tadashi Harumoto, Hideo Yano and Ryoji Kawashima* 1355

Carbohydrates and Fibers

Dietary Fiber Sources Lower Blood Cholesterol in C57BL/6 Mice. *Jacqueline K. Hundemer, Supriya P. Nabar, Brent J. Shriver and Lawrence P. Forman* 1360

Vitamins

Glutathione Levels and Related Enzyme Activities in Vitamin B-6–Deficient Rats Fed a High Methionine and Low Cystine Diet. *Fumio Takeuchi, Sukehisa Izuta, Ryoko Tsubouchi and Yukio Shibata* 1366

Minerals and Trace Elements

Inhibitory Effect of Dietary Soybean Protein vs. Casein on Magnesium Absorption in Rats. *E. J. Brink, P. R. Dekker, E.C.H. Van Beresteijn and A. C. Beynen* 1374

Calcium, Magnesium and Phosphorus Utilization by Rats Fed Sodium and Potassium Salts of Various Inorganic Anions. *J. L. Greger, Susan M. Kaup and Alison R. Behling* 1382

Nutrient Uptake and Transport

Intestinal Metallothionein Gene Expression and Zinc Absorption in Rats Are Zinc-Responsive but Refractory to Dexamethasone and Interleukin 1α. *James M. Hempe, Joel M. Carlson and Robert J. Cousins* 1389

Growth, Development and Aging

Energetic Efficiency of Rats Fed Low or High Protein Diets and Grown at Controlled Rates From 80 to 205 Grams. *Michael L. Thonney, Andrew M. Arnold, Deborah A. Ross, Stephanie L. Schaaf and Theodore R. Rounsaville* 1397

Metabolism and Hormonal Regulation

Dietary Glucose Increases Plasma Insulin and Decreases Brown Adipose Tissue Thermogenic Activity in Adrenalectomized *ob/ob* Mice. *Ye-Min Nei and Dale R. Romsos* 1407

Somatostatin, Gastrin-Releasing Peptide and Gastrin in the Stomach of Rats with Streptozotocin-Induced Diabetes and Insulinoma. *Peter R. Flatt, Clifford J. Bailey and J. Michael Conlon* 1414

Nutrition and Immunology

Lymphocyte Subpopulations in the Thymus, Lymph Nodes and Spleen of Iron-Deficient and Rehabilitated Mice. *Agnès Dhur, Pilar Galan, Paul Preziosi and Serge Hercberg* 1418

Enhancement of Primary Systemic Acquired Immunity by Exogenous Triiodothyronine in Wasted, Protein-Energy Malnourished Weanling Mice. *Joseph W. Woods and Bill D. Woodward* 1425

Flow Cytometric Analysis of the Phenotypic Distribution of Splenic Lymphocytes in Zinc-Deficient Adult Mice. *Louis E. King and Pamela J. Fraker* 1433

Nutrition and Disease Interactions

Effects of Intravenous Nutrition on Lipoprotein Metabolism, Body Composition, Weight Gain and Uremic State in Experimental Uremia in Rats. *Annika Wennberg, Hans-Erik Norbeck, Gunnar Sterner and Kent Lundholm* 1439

Increased Dietary Branched-Chain Amino Acids Do Not Improve Growth in Developing Rats with Chronic Biliary Obstruction. *Sally A. Weisdorf, Nicholas Hamel, Mary Ella Pierpont, Larry D. Bowers and Frank B. Cerra* 1447

High Protein Intake Promotes the Growth of Hepatic Preneoplastic Foci in Fischer #344 Rats: Evidence that Early Remodeled Foci Retain the Potential for Future Growth. *Linda D. Youngman and T. Colin Campbell* 1454

Nutrition and Physical Activity

Dietary Protein Level and Energy Metabolism During Treadmill Exercise in Horses. *Peggy A. Miller-Graber, Laurie M. Lawrence, Jonathan H. Foreman, Karin D. Bump, Mark G. Fisher and Elaine V. Kurcz* 1462

SYMPOSIUM

Current Topics in Avian Lipid Metabolism and Biochemistry

Symposium on Current Topics in Avian Lipid Metabolism and Biochemistry. *Pamela S. Hargis* .. 1470

Receptor-Mediated Lipoprotein Transport in Laying Hens. *Johannes Nimpf and Wolfgang J. Schneider* 1471

Importance of Essential Fatty Acids and Their Derivatives in Poultry. *Bruce A. Watkins* 1475

Adipose Cellularity in *Gallus domesticus*: Investigations to Control Body Composition in Growing Chickens. *A. Lee Cartwright* 1486

ISSUES AND OPINIONS IN NUTRITION

Future Directions for the American Institute of Nutrition. *Michael N. Kazarinoff and Jean-Pierre Habicht* 1498

Proceedings of the Fifty-Fifth Annual Meeting of the American Institute of Nutrition. 1500

Announcements 1513

No. 10 OCTOBER

BIOGRAPHICAL ARTICLE

Edward Smith (1819–1874). *Kenneth J. Carpenter* 1515

ARTICLES

Lipids

Dietary Taurine Content Changes Liver Lipids in Cats. *A. Cantafora, I. Blotta, S. S. Rossi, A. F. Hofmann and J. A. Sturman* 1522

Hepatic Cholesterol and Fatty Acid Synthesis in Pregnant and Fetal Rats: Effect of Maternal Dietary Fat and Cholestyramine. *Neil C. Haave and Sheila M. Innis* 1529
Response of (*n*-3) and (*n*-6) Fatty Acids in Piglet Brain, Liver and Plasma to Increasing, but Low, Fish Oil Supplementation of Formula. *L. Dianne Arbuckle, France M. Rioux, Murray J. MacKinnon, Nina Hrboticky and Sheila M. Innis* 1536
Dietary Essential Fatty Acids Change the Fatty Acid Profile of Rat Neural Mitochondria Over Time. *John R. Dyer and Carol E. Greenwood* 1548
Differential Effects of Fish Oil, Safflower Oil and Palm Oil on Fatty Acid Oxidation and Glycerolipid Synthesis in Rat Liver. *Margaret A. Halminski, Julian B. Marsh and Earl H. Harrison* 1554
Changes in Colonic Antioxidant Status in Rats During Long-Term Feeding of Different High Fat Diets. *Connye Kuratko and Barbara C. Pence* 1562

Proteins and Amino Acids

Composition of Nitrogen-Containing Fractions in Digesta From the Distal Ileum of Pigs Fed a Protein-Free Diet. *Paul J. Moughan and Gerard Schuttert* 1570
Homoarginine Labeling is Suitable for Determination of Protein Absorption in Miniature Pigs. *Martin Schmitz, Hans Hagemeister and Helmut F. Erbersdobler* 1575
Relationship Between Protein Intake and Hepatic Protein Synthesis in Rats. *Richard S. Eisenstein and Alfred E. Harper* 1581
Arginine-Deficient Diets Alter Plasma and Tissue Amino Acids in Young and Aged Rats. *Kathy L. Gross, Wilburta J. Hartman, Alayne Ronnenberg and Ronald L. Prior* 1591

Carbohydrates and Fibers

Carbohydrate Utilization by White Sturgeon as Assessed by Oral Administration Tests. *Silas S. O. Hung* 1600
4′-Galactooligosaccharide Affects Sodium and Potassium Metabolism in Rats. *Masatoshi Hayashi, Shigehiro Taki, Fukiko Ueda, Yasuie Shimazaki, Osamu Ito, Shinichi Kamata, Norihide Kakiichi and Atsushi Shitara* 1606

Vitamins

Concentrations of Selected Carotenoids and Vitamin A in Human Liver, Kidney and Lung Tissue. *Harold H. Schmitz, Christopher L. Poor, R. B. Wellman and John W. Erdman, Jr.* 1613
L-Ascorbyl-2-Monophosphate has Equal Antiscorbutic Activity as L-Ascorbic Acid but L-Ascorbyl-2-Sulfate is Inferior to L-Ascorbic Acid for Channel Catfish. *Gamel O. El Naggar and Richard T. Lovell* 1622
Insensitivity of the Tryptophan-Load Test to Marginal Vitamin B-6 Intake in Rats. *Monica C. Schaeffer, David A. Sampson, James H. Skala, Dennis K. O'Connor and Denise Gretz* 1627
Dietary Phosphate Deprivation Increases Renal Synthesis and Decreases Renal Catabolism of 1,25-Dihydroxycholecalciferol in Guinea Pigs. *Maura Simboli-Campbell and Glenville Jones* ... 1635
Biological Activity of Racemic Folate Mixtures Fed to Folate-Depleted Rats. *N. D. Bills, A. D. Jones and A. J. Clifford* 1643

Nutrient Interactions

Canthaxanthin and Excess Vitamin A Alter α-Tocopherol, Carotenoid and Iron Status in Adult Rats. *Shirley R. Blakely, Geraldine V. Mitchell, Mamie Y. Jenkins, Erich Grundel and Paul Whittaker* 1649

Metabolism and Hormonal Regulation

Nutrient Balance and Stage of Lactation Affect Responses of Insulin, Insulin-Like Growth Factors I and II, and Insulin-Like Growth Factor–Binding Protein 2 to Somatotropin Administration in Dairy Cows. *John L. Vicini, Frances C. Buonomo, Jeffrey J. Veenhuizen, Margaret A. Miller, David R. Clemmons and Robert J. Collier* 1656

Nutrition and Immunology

Leucine and its Catabolites Alter Mitogen-Stimulated DNA Synthesis by Bovine Lymphocytes. *Brian J. Nonnecke, Sharon T. Franklin and Steven L. Nissen* 1665

Nutrition, Pharmacology and Toxicology

Effect of Fiber, Protein Source and Time of Feeding on Methotrexate Toxicity in Rats. *Martha A. Funk and David H. Baker* 1673

Effect of Soy Products on Methotrexate Toxicity in Rats. *Martha A. Funk and David H. Baker*. 1684

Nutrition and Disease Interactions

Dietary Soybean Isolate and Methionine Supplementation Affect Mammary Tumor Progression in Rats. *E. J. Hawrylewicz, H. H. Huang and W. H. Blair* 1693

Announcements 1699

No. 11 NOVEMBER 1991

HISTORY OF NUTRITION

Rudolf Schoenheimer and the Concept of the Dynamic State of Body Constituents. *Karl Y. Guggenheim* 1701

ARTICLES

Lipids

Plasma Very Low Density Lipoproteins from Male Rats Fed Casein or Soybean Protein Diets: A Comparison of Fatty Acid Composition and Influence on Prostanoid Production. *Linnéa Sjöblom, Anders Eklund, Lena Humble, Angela Menschik-Lundin and Ann-Margret Östlund-Lindqvist* ... 1705

Proteins and Amino Acids

13-*cis*-Retinoic Acid Alters Methionine Metabolism in Rats. *Kevin L. Schalinske and Robert D. Steele* 1714

Use of a Four-Parameter Logistic Equation to Evaluate the Response of Growing Rats to Ten Levels of Each Indispensable Amino Acid. *Mark J. Gahl, Mark D. Finke, Thomas D. Crenshaw and N. J. Benevenga* 1720

Carbohydrates and Fibers

High Propionic Acid Fermentations and Mineral Accumulation in the Cecum of Rats Adapted to Different Levels of Inulin. *Marie-Anne Levrat, Christian Rémésy and Christian Demigné*..... 1730

Vitamins

Pyridoxal-5′-Phosphate and Pyridoxal Biokinetics in Male Wistar Rats Fed Graded Levels of Vitamin B-6. *Wilhelmina Bode and Henk van den Berg* 1738

Minerals and Trace Elements

Lactose, Calcium Source and Age Affect Calcium Bioavailability in Rats. *Maciej S. Buchowski and Dennis D. Miller* 1746

Dietary Citrate and Kidney Function Affect Aluminum, Zinc and Iron Utilization in Rats. *Carolyn A. Ecelbarger and J. L. Greger* 1755
Compromised Zinc Status in Rats Adversely Affects Calcium Metabolism in Platelets. *Boyd L. O'Dell and Michelle Emery* 1763
Human Calcium Absorption from Whole-Wheat Products. *Connie M. Weaver, Robert P. Heaney, Berdine R. Martin and Mary Lee Fitzsimmons* 1769
Phosphorus, but not Calcium, Affects Manganese Absorption and Turnover in Chicks. *Karen J. Wedekind, Evan C. Titgemeyer, A. Robert Twardock and David H. Baker* 1776

Nutrient Uptake and Transport

Absorption of Short-Chain Fatty Acids from the Rat Cecum in Vivo. *S. E. Fleming, S. Y. Choi and M. D. Fitch* 1787

Growth, Development and Aging

Energy Restriction and the Partitioning of Energy among the Costs of Reproduction in Rats in Relation to Growth of the Progeny. *Aija Sadurskis, Annica Sohlström, Nazma Kabir and Elisabet Forsum.* 1798

Metabolism and Hormonal Regulation

Dietary Fat Saturation Affects Glucose Metabolism Without Affecting Insulin Receptor Number and Affinity in Adipocytes from BHE Rats. *Ju-Shin Pan and Carolyn D. Berdanier* 1811
Dietary Fat Saturation Affects Hepatocyte Insulin Binding and Glucose Metabolism in BHE Rats. *Ju-Shin Pan and Carolyn D. Berdanier* 1820
The Drug LY79771 Affects Fat Regain by Starved and Refed BHE Rats. *Debra A. Cooper and Carolyn D. Berdanier* 1827
Interpretation of Nutrient-Response Relationships in Rats. *Arthur R. Schulz* 1834

Nutrition and Immunology

Dietary Polyunsaturated Fatty Acids Modulate Fatty Acid Composition and Early Activation Steps of Concanavalin A–Stimulated Rat Thymocytes. *Laurence Valette, Martine Croset, Annie-France Prigent, Nadia Meskini and Michel Lagarde* 1844
Influence of Intake of Skim Milk from Cows Immunized with Intestinal Bacterial Antigens on Onset of Renal Disease in (NZB × NZW)F_1 Mice Fed Ad Libitum or Restricted in Energy Intake. *Shinji Murosaki, Yasunobu Yoshikai, Chiharu Kubo, Atsunori Ishida, Goro Matsuzaki, Tomonobu Sato, Katsumi Endo and Kikuo Nomoto* 1860

Nutrition, Pharmacology and Toxicology

Iron Supplementation Increases Gentamicin Nephrotoxicity in Rats. *Sandra E. Kays, Wayne A. Crowell and Mary Ann Johnson* 1869

Nutrition and Disease Interactions

The Effect of Diet, Exercise and 7,12-Dimethylbenz(a)anthracene on Food Intake, Body Composition and Carcass Energy Levels in Virgin Female BALB/c Mice. *Helen W. Lane, Robert E. Keith, Susan Strahan and Marguerite T. White* 1876
Reduced Energy Intake and Moderate Exercise Reduce Mammary Tumor Incidence in Virgin Female BALB/c Mice Treated with 7,12-Dimethylbenz(a)anthracene. *Helen W. Lane, Patricia Teer, Robert E. Keith, Marguerite T. White and Susan Strahan* 1883

SYMPOSIUM

History of Nutrition: History and Current Status of Research in Human Energy Metabolism

History of Nutrition: History and Current Status of Research in Human Energy Metabolism. *Buford L. Nichols, Jr. and Peter J. Reeds* 1889

Assumptions Used in Measurements of Energy Metabolism. *Paul R. Swyer* 1891
The Measurement of Energy Expenditure. *Paul Webb* 1897
Thermodynamics and Living Systems: Problems and Paradigms. *G. Rickey Welch* 1902
Practical Estimates of Energy Requirements. *J.V.G.A. Durnin* 1907

LETTER TO THE EDITOR

Request for Materials Concerning the Nutrient Requirements of Laboratory Animals. *N. J. Benevenga* 1914

Announcements 1915

No. 11s NOVEMBER 1991

WALTHAM INTERNATIONAL SYMPOSIUM ON THE NUTRITION OF SMALL COMPANION ANIMALS

Proceedings of a conference held at the School of Veterinary Medicine, University of California, Davis, California, September 4–8, 1990

Guest Editors: James G. Morris, D'Ann Finley and Quinton R. Rogers

Historical Perspective

Contribution of the Dog to the Science of Nutrition. *Kenneth J. Carpenter* S1

Energy Requirements

Body Mass, Maintenance and Basal Metabolism in Dogs. *A. A. Heusner* S8
Dogs Large and Small: The Allometry of Energy Requirements within a Single Species. *Ivan H. Burger and Janel V. Johnson* S18
Evaluation of the Energy Requirements of Adult Kennel Dogs. *Mark D. Finke* S22
Energy Requirements for Maintenance and Growth of Wild Mammals, Birds and Reptiles in Captivity. *James K. Kirkwood* S29
Energy Requirements of Growing Great Danes. *Helmut Meyer and Jürgen Zentek* S35
Energy Requirement for Maintenance of Adult Dogs. *K. Männer* S37
Maintenance Energy Requirement of Dogs: What is the Correct Value for the Calculation of Metabolic Body Weight in Dogs? *Ellen Kienzle and Anna Rainbird* S39
Nutrition of Old Dogs. *Hans Christian Mundt* S41
Energy Requirements of the Queen During Lactation and Kittens from Birth to 12 Weeks. *Helen S. Munday and Kay E. Earle* S43
Digestible Energy Requirements of Adult Cats at Maintenance. *K. E. Earle and P. M. Smith* S45

Obesity

Use of Ultrasound in the Measurement of Subcutaneous Fat and Prediction of Total Body Fat in Dogs. *Michael J.A. Wilkinson and Neil A. McEwan* S47
Obesity in the Dog: Role of the Adrenal Steriod Dehydroepiandrosterone (DHEA). *E. Gregory MacEwen and Ilene D. Kurzman* S51
Investigations on Palatability, Digestibility and Tolerance of Low Digestible Food Components in Cats. *Ellen Kienzle, Helmut Meyer and Roland Schneider* S56
Body Condition and Diet of Relatively Healthy Older Dogs. *Susan Donoghue, Lester Khoo, Lawrence T. Glickman and David S. Kronfeld* S58

Protein

Effect of Dietary Nitrogen on Nutritional and Metabolic Responses of Kittens Fed Graded Levels of Methionine. *M. J. Streiker, J. G. Morris and Q. R. Rogers* S60
Canine Colonic Microstructure and Function as Affected by the Level of Dietary Protein. *A. A. Zalesky, L. A. Rainforth and E. T. Clemens* S61
Effect of Portosystemic Shunting on Nitrogen Retention of Dogs. *Dorothy P. Laflamme, Sheila W. Allen and Thomas L. Huber* S62
Amino Acid Composition and Digestibility of Four Protein Sources for Dogs. *Karin Neirinck, Louis Istasse, Annick Gabriel, Christian Van Eenaeme and Jean-Marie Bienfait* S64

Vitamins and Trace Minerals

Some Observations on the Dietary Vitamin D Requirement of Weanling Pups. *R. D. Kealy, D. F. Lawler and K. L. Monti* S66
Effects of 1,25-dihydroxycholecalciferol and 24,25-dihydroxycholecalciferol in Dogs with Impaired Renal Function. *David A. Dzanis, Carlos N. Corbellini, Lennart Krook and Francis A. Kallfelz* S70
Biotin Deficiency in Cats as Induced by Feeding a Purified Diet Containing Egg White. *F.J.H. Pastoor, H. Van Herck, A. TH. Van 'T Klooser and A. C. Beynen* S73
Role of the Pancreas in the Absorption and Malabsorption of Cobalamin (Vitamin B-12) in Dogs. *Roger M. Batt, Neil U. Hordagoda and Kenneth W. Simpson* S75
Pathology Associated with Vitamin B-6 Deficiency in Growing Kittens. *Patricia C. Blanchard, Sungchul C. Bai, Quinton R. Rogers and James G. Morris* S77
Effects of Two Levels of Zinc Intake on Growth and Trace Element Status in Labrador Puppies. *D. Booles, I. H. Burger, A. L. Whyte, R. S. Anderson, G. M. Carlos and I. P. Robinson* S79
Zinc, Copper, Iron and Calcium Concentrations in Bitch Milk. *Ronald S. Anderson, Gerard M. Carlos, Irene P. Robinson, Derek Booles, Ivan H. Burger and Anna L. Whyte* S81
Investigations on Copper Deficiency in Growing Dogs. *Jürgen Zentek and Helmut Meyer* S83

Macrominerals and Urine pH

An Alternative Method for the Collection of Urine and Feces and Its Application in Measuring Urinary Mineral Excretion in Cats Fed Diets Containing Various Amounts of Phosphorus. *F.J.H. Pastoor, A. TH. Van 'T Klooster, A. Lankhorst, J.N.J.J. Mathot and A. C. Meynen* S85
Influence of Food Composition on the Urine pH in Cats. *Ellen Kienzle, Annette Schuknecht and Helmut Meyer* S87
Effect of Various Acidifying Agents on Urine pH and Acid-Base Balance in Adult Cats. *Julia V. Izquierdo and Gail L. Czarnecki-Maulden* S89
Effect of Low Potassium Commercial Nonpurified Diet on Renal Function of Adult Cats. *C. A. Tony Buffington, Stephen P. DiBartola and Dennis J. Chew* S91
Effect of Macromineral Composition of Diets on Blood Acid-Base Equilibrium and Urinary Acidity in Dogs. *Dominique M. Gevaert, Arie TH. Van 'T Klooster, Roland O. De Wilde and Henk J. Kappert* S93
Calcium Metabolism of Rabbits as an Etiological Factor for Urolithiasis. *Josef Kamphues* S95
Intracellular Cations: Out of Sight, Out of Mind? *A. R. Michell* S97

Growth and Skeletal Development

Calcium Metabolism in Great Dane Dogs Fed Diets with Various Calcium and Phosphorus Levels. *Herman A. W. Hazewinkel, Walter E. Van Den Brom, Arie TH. Van 'T Klooster, George Voorhout and Ank Van Wees* S99
Growth and Skeletal Development in Great Dane Pups Fed Different Levels of Protein Intake. *Richard C. Nap, Herman A. W. Hazewinkel, George Voorhout, Walter E. Van Den Brom, Sinus A. Goedegebuure, and Arie TH. Van 'T Klooster* S107
Relationship Between Nutrition and Bone Growth in Large and Giant Dogs. *Klaus Dämmrich* S114
Body Composition of Cats as a Basis for Factorial Calculation of Energy and Nutrient Requirements for Growth. *Ellen Kienzle, Birgit Stratmann and Helmut Meyer* S122

Effect of Diet on Induction and Treatment of Renal Failure

Role of Diet in the Progression of Chronic Renal Failure: Experience With Human Studies and Proposed Mechanisms by Which Nutrients May Retard Progression. *Joel D. Kopple* S124
Dietary Protein Intake and the Glomerular Adaptations to Partial Nephrectomy in Dogs. *Scott A. Brown, Delmar R. Finco, Wayne A. Crowell and L. Gabriel Navar* S125
Influence of Dietary Protein in Renal Function in Dogs. *Kenneth C. Bovée* S128
Effect of Modified Protein Diets in Dogs and Cats with Chronic Renal Failure: Current Status. *David J. Polzin, Carl A. Osborne and Larry G. Adams* S140
Effects of Medium Protein Diets in Dogs with Chronic Renal Failure. *Josef L. Leibetseder and Klaus W. Neufeld* S145

Diet and Disease

Abnormal Intestinal Permeability Could Play a Role in the Development of Gluten-Sensitive Enteropathy in Irish Setter Dogs. *Edward J. Hall and Roger M. Batt* S150
Delayed Introduction of Dietary Cereal May Modulate the Development of Gluten-Sensitive Enteropathy in Irish Setter Dogs. *Edward J. Hall and Roger M. Batt* S152
Development of a Gastro-Jejunal Tube for the Dog. *E. M. Hardie and P. J. Armstrong* S154
Dietary Management of Idiopathic Feline Hepatic Lipidosis with a Liquid Diet Supplemented with Citrulline and Choline. *V. Biourge, P. Pion, J. Lewis, J. G. Morris and Q. R. Rogers* S155
Body Condition and Energy Intakes of Dogs in a Referral Teaching Hospital. *David S. Kronfeld, Susan Donoghue and Lawrence T. Glickman* S157
Occurrence of Ascites Abdominalis in Dogs. *Ildikó Škardová* S159
Development of a Model of Food Hypersensitivity in the Dog: Preliminary Observations. *W. G. Guilford, Q. R. Rogers, H. Olander, L. J. Gershwin and D. R. Strombeck* S161
Dog Biscuits: An Aid in Canine Tartar Control. *Amy C. Samuelson and G. R. Cutter* S162
Safety of Ethoxyquin in Dog Foods. *David A. Dzanis* S163
Mites Infestation of Feedstuffs for Small Companion Animals. *J. Kamphues* S165

Taurine

Dietary Taurine and Feline Reproduction and Development. *John A. Sturman* S166
Plasma Taurine Levels in Healthy Cats and Cats with Cardiac Disorders. *M. Skrodzki, E. Trautvetter and E. Mönch* S171
Gender and Dietary Amino Acid Supplementation Influence the Plasma and Whole Blood Taurine Status of Taurine-Depleted Cats. *Elke A. Trautwein and K. C. Hayes* S173
Influence of Taurine Intake on Plasma Taurine Values and Renal Taurine Excretion of Cats. *Andrea Mühlum and Helmut Meyer* S175
Effect of Meal-Feeding and Food Deprivation on Plasma and Whole Blood Taurine Concentrations in Cats. *P. D. Pion, J. Lewis, K. Greene, Q. R. Rogers, J. G. Morris and M. D. Kittleson* S177
Feline Plasma and Whole Blood Taurine Levels as Influenced by Commercial Dry and Canned Diets. *Gregory M. Douglass, Edward B. Fern and Robert C. Brown* S179
Effect of Dietary Protein and Taurine on Enzyme Activities Involved in Cysteine Metabolism in Cat Tissues. *T. Park, A. A. Jerkins, R. D. Steele, Q. R. Rogers and J. G. Morris* S181
In Vivo Conversion of Cysteic Acid to Taurine in the Cat. *S. E. Edgar, J. G. Morris, Q. R. Rogers and M. A. Hickman* S183
Taurcholic Acid Turnover in Taurine-Depleted and Normal Cats. *M. A. Hickman, Q. R. Rogers and J. G. Morris* S185

Nutrition of Caged Birds

The Nutrition of the Budgerigar (*Melopsittacus undulatus*). *Kay E. Earle and Nigel R. Clarke* S186
Formulated Diets Versus Seed Mixtures for Psittacines. *Duane E. Ullrey, Mary E. Allen and David J. Baer.* S193
Cockatiel (Nymphicus Hollandicus) Nutrition. *T. E. Roudybush and C. R. Grau* S206
Basic Data for Factorial Derivation of Energy and Nutrient Requirements of Growing Canaries. *Josef Kamphues and Helmut Meyer* S207

Intoxication in Canaries Due to Endrin-Contaminated Feedstuff. *Josef Kamphues, Norbert Kummerfeld and Bodo Johannes* S209

No. 12 DECEMBER 1991

ARTICLES

Lipids

Maternal Dietary Fat Type Influences the Growth and Fatty Acid Composition of Newborn and Weanling Rats. *Dorothy B. Hausman, Holly M. McCloskey and Roy J. Martin* 1917

High Levels of the (n-6) Fatty Acid 4,7,10,13,16-Docosapentaenoate in the Retinas of Rabbits are Reduced by Feeding Dietary Fish Oil from Birth to Adult Life. *Don S. Lin, Gregory J. Anderson and William E. Connor* 1924

Proteins and Amino Acids

Dietary Excesses of Leucine Influence Growth and Body Composition of Rainbow Trout. *Poh-Sze Choo, Trevor K. Smith, C. Young Cho and Hugh W. Ferguson* 1932

Carbohydrates and Fibers

Nominal Response of Passage Rates to Fiber Particle Size in Rats. *Bret R. Luick and Michael H. Penner* 1940

Vitamins

Vitamin B-12 Deficiency Increases the Specific Activities of Rat Liver NADH- and NADPH-Linked Aquacobalamin Reductase Isozymes Involved in Coenzyme Synthesis. *Fumio Watanabe, Yoshihisa Nakano, Noriyuki Tachikake, Hisako Saido, Yoshiyuki Tamura and Hiroyuki Yamanaka* 1948

Bacterially Synthesized Folate in Rat Large Intestine is Incorporated into Host Tissue Folyl Polyglutamates. *Ni Rong, Jacob Selhub, Barry R. Goldin and Irwin H. Rosenberg* 1955

Mitogen Response of B Cells, but not T Cells, is Impaired in Adult Vitamin A–Deficient Rats. *Ariëtte M. van Bennekum, Letitia R. Wong Yen Kong, Marion J. J. Gijbels, Frans J. Tielen, Paul J. M. Roholl, Adriaan Brouwer and Henk F. J. Hendriks* 1960

Glutathione Blood Levels and Other Oxidant Defense Indices in Men Fed Diets Low in Vitamin C. *Susanne M. Henning, Jian Z. Zhang, Ralph W. McKee, Marian E. Swendseid and Robert A. Jacob* 1969

Nutrient Interactions

Effect of Oat Bran Muffins on Calcium Absorption and Calcium, Phosphorus, Magnesium and Zinc Balance in Men. *Herta Spencer, Clemontain Norris, Jeanine Derler and Dace Osis* 1976

Nutrient Requirements

Thiamin Requirement of Juvenile Shrimp (*Penaeus monodon*). *Houng-Yung Chen, Feng-Cheng Wu and Shu-Ying Tang* 1984

Growth, Development and Aging

Age-Related Changes in Whole-Body Amino Acid Kinetics and Protein Turnover in Rats. *Christiane Obled and Maurice Arnal* 1990

Fructose and Sucrose Feeding during Pregnancy and Lactation in Rats Changes Maternal and Pup Fuel Metabolism. *K-L. Catherine Jen, Caramarie Rochon, Shaobin Zhong and Lane Whitcomb* 1999

Metabolism and Hormonal Regulation

Assessment of Thermal Status of Somatotropin-Injected Lactating Holstein Cows Maintained under Controlled-Laboratory Thermoneutral, Hot and Cold Environments. *Wasmen Manalu, Harold D. Johnson, Ru-Zhi Li, Barbara A. Becker and Robert J. Collier* 2006
Abomasal Casein Infusion and Exogenous Somatotropin Enhance Nitrogen Utilization By Growing Lambs. *Donald H. Beermann, Todd F. Robinson, Todd M. Byrem, Douglas E. Hogue, Alan W. Bell and Carol L. McLaughlin* 2020
Sodium Pivalate Treatment Reduces Tissue Carnitines and Enhances Ketosis in Rats. *Peri Book Bianchi and Alan T. Davis* 2029
Antiobesity Effects of Dehydroepiandrosterone Are Mediated by Futile Substrate Cycling in Hepatocytes of BHE/cdb Rats. *Michael K. McIntosh and Carolyn D. Berdanier* 2037

Nutrition and Disease Interactions

Age and Protein Restriction Followed by Balanced Refeeding Affect Pancreatic Digestive Enzyme Outputs and Turnover Times in Rats. *Josiane Prost and Jacques Belleville* 2044

LETTER TO THE EDITOR

Supplementation of Humans with Vitamin E. *Irene Simon-Schnass* 2055
Reply to the Letter of Dr. Simon-Schnass. *Max K. Horwitt* 2056

Announcements 2057
Acknowledgment 2058
Author Index, Volume 121 2060
Subject Index, Volume 121 2065
1991 Cumulative Contents iii